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DIETARY FIBER

A FEAST FOR YOUR BODY



University of Massachusetts Medical Center
Professional Nutrition Services

55 Lake Avenue, North
Worcester, MA. 01655 2397
(617) 856-3367/2492

912/361

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What is Fiber

Dietary fibers come only from plants. They are the chemical substances in the cell walls that give plants structure and stability. Fibers include cellulose, polysaccharides, hemicellulose, pectins, gums, mucilages, and lignin.

Different kinds of plants contain different fibers. For example, bran is almost entirely cellulose; apples, grapes and some other fruits are high in pectins.

Fibers are not digested by human digestive enzymes. However, many are partially or completely digested by bacteria that reside in the gut, resulting in the production of gases.

Some fibers, such as cellulose, hemicellulose and lignin, are not soluble in water. These are called "insoluble" fibers and they do predominate in whole grains. Others, such as pectin (used to make jelly), gums, and mucilages are water-soluble and can leach out into cooking water. They are found naturally in fruits and vegetables, beans, and whole oats and are used as additives in processed foods. These are referred to as "soluble" fibers.

The Health Effects of Fiber

Fiber may play an important role in our health. There is good evidence, for example, that certain dietary fibers can lower blood cholesterol levels and improve the processing of blood sugar of people with diabetes.

High-fiber diets have been helpful to many patients with chronic intestinal disorders, such as constipation, spastic colon, diverticular disease, and Crohn's disease. Fiber may help to lower blood pressure and ward off gallstones.

Fiber is best consumed as an integral part of foods - whole grain cereals and breads, nuts, seeds, fruits and vegetables - rather than as a dietary supplement. Fiber "pills" are of no known benefit.

Having accurate information regarding fiber is essential before you make any change in your diet. People with diet-related disorders should not attempt self-treatment with fiber without first consulting their physician.

Gastrointestinal Effects

Fiber substances can absorb many times their weight in water, and most pass through the human digestive tract undigested, resulting in softer and bulkier stools.

Bran, which is mostly cellulose, helps to relieve constipation. It acts as a sponge, holding water and softening the stool, increasing its volume and elimination of food wastes. Apples (unpeeled) and fresh carrots are also useful in countering constipation.

Weight Control

Before it gets to the large intestine, fiber swells and creates a feeling of fullness that may help you cut back on the amount of food you consume and lengthen the time between meals.

Many fibrous foods also take longer to chew and thus force you to eat more slowly and give your brain time to register satiety before you eat too much.

Diabetes

When placed on a diet high in fiber-rich carbohydrate foods but very low in fat and sugar, people with diabetes may improve control.

Pectins and gums have the most immediate effects on blood sugar, whereas wheat bran (cellulose) seems to offer some long-term benefits.

It has been shown that fiber delays the passage of food from the stomach to the intestine.

This slows the conversion of starches to the blood sugar glucose, which reduces the need for a large output of insulin, the hormone that functions improperly in diabetes. This benefit of fiber is obtained only if high-fiber foods are included in a meal, not as a between-meal supplement.

Blood_Fats

High levels of blood fats are associated with an increased risk of heart disease, and certain fibers can reduce the amount of fatty substances - cholesterol and triglycerides - in the blood. Here again, the soluble fibers - pectins and gums - are most effective, whereas wheat bran offers no benefits.

Blood cholesterol reductions may be achieved by adding foods rich in soluble fibers, such as whole oats, oat bran, carrots, or guar crispbread, to the diet. But the greatest improvement results from simultaneously eating less fats and cholesterol and more starchy carbohydrates.

The_Risk

High-fiber diets can also have some undesirable effects. The most common is a temporary increase in flatulence and bloating, usually lasting about three weeks but in some cases for two or more months.

These individuals who decide to increase the amount of fiber in their diet are advised to proceed slowly. A gradual weekly increase in fiber with a goal of 40 gm of dietary fiber per day is recommended. (Refer to Step Plan to High Fiber Diet later in this booklet).

SOURCES OF DIFFERENT TYPES OF FIBER

Source	Types of Fiber
Cellulose	Coarse bran, unpeeled apples and pears, Brazil nuts, canned peas, fresh carrots.
Hemicellulose	Bran cereals, whole grain breads, beets, eggplant, radishes.
Lignin	Pears, toasted whole grain breads, fried browned potatoes.
Pectin	Bananas, oranges, apples, potatoes, cabbage, carrots, grapes.
Gums	Oatmeal, sesame seeds, (cooked or baked), beans, bulk laxatives.

HOW MUCH DIETARY FIBER IS IN YOUR FOOD?

Food	Amount	Weight (grams)	Fiber (grams)
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BREADS, CRACKERS AND CEREALS

All Bran or 100% Bran	1 cup	70	23
Bran Buds	3/4 cup	80	18
Bulger, dry	1/3 cup	50	5.6
Graham crackers	2 sq.	15	1.5
Grapenuts	1/3 cup	45	5.0
Grits, dry	1/4 cup	45	4.8
Rolled oats, dry	1/2 cup	50	4.5
Rye bread	1 slice	25	2
Shredded wheat	2 biscuits	50	6.1
Whole wheat bread	1 slice	25	2.4

FRUITS

Apple	1 small	90	3.1
Applesauce	1/2 cup	120	1.7
Banana	1 med.	100	1.8
Cantaloupe, cubes	3/4 cup	120	1.4
Cherries, raw	10	70	.8
Grapefruit	1/2 fruit	200	2.6
Orange, juic.	1/2	90	.4

Food	Amount	Weight (grams)	Fiber (grams)
Orange	1 small	90	1.8
Peach, raw	1 med.	100	1.3
Peaches, canned	1/2 cup	120	1.3
Pear, raw	1 med.	120	2.8
Pears, canned	1/2 cup	125	1.4
Plum, raw	2 small	90	1.6
Strawberries	1/2 cup	125	2.6
Tangerine	1 med.	100	2.1

VEGETABLES

Beans, green	1/2 cup	50	1.2
Beets, cooked	2/3 cup	100	2.1
Broccoli, cooked	3/4 cup	75	1.6
Cabbage, cooked	3/4 cup	100	2.2
Cabbage, raw	1 cup	75	2.1
Carrots, cooked	3/4 cup	100	2.1
Carrots, raw	1 med.	100	3.7
Cauliflower, cooked	1/2 cup	100	1.2
Cauliflower, raw	1 cup	100	1.8
Celery, cooked	2/3 cup	100	2.4
Celery, raw	2 1/2 stalks	100	3.0
Corn kernels	2/3 cup	100	4.2
Cucumber	1/2 of 7"	100	1.5
Kale, cooked	1/2 cup	100	2.0
Kidney beans, cooked	1 cup	75	3.6
Lentils, cooked	1/2 cup	100	4.0
Lettuce	1 cup	50	.8
Parsnips, cooked	3/4 cup	120	5.9
Peas, cooked	1/2 cup	60	3.8
Potatoes, cooked	2/3 cup	90 (raw)	3.1
Rice, brown, cooked	1 cup	65	1.1
Rice, white, cooked	1 cup	65	.4
Spinach	2 lg. leaves	50	1.8
Summer squash, cooked	1/2 cup	100	2.2
Summer squash, raw	1 5"	100	3.0
Turnip, raw	1 cup	100	2.2

STEP-BY-STEP PLAN TO HIGH FIBER DIET

This Step-by-Step Plan is designed to help you gradually increase the amount of fiber in your diet. The plan begins with simple substitutions, then recommends high fiber additions, followed by flavorful and easy high fiber cooking ideas using unprocessed bran or bran cereal.

The steps are divided into two weeks each. It is recommended that you use the full two weeks for each step. This will allow your body time to adjust to a higher fiber diet while you get used to selecting fiber-rich foods. If, at any step, you feel intestinal discomfort, decrease your fiber intake and then gradually increase it again until your body has adapted. You should drink extra glasses of water during the day with or between meals. Water will help to compensate for any water loss due to the bulk properties of fiber.

<u>Steps</u>	<u>Recommendations</u>	<u>Serving Suggestions</u>
STEP 1 WEEKS 1 & 2	*Choose bran and whole grain and cereals often.	*A 1-ounce serving of your favorite high fiber ready- to-eat cereals provides anywhere from 4 to 13 grams of fiber. *Try wild and/or brown rice. *Use whole grain breads like whole wheat, cracked wheat, or other fiber-containing breads and rolls rye or pumpernickel.

<u>Steps</u>	<u>Recommendations</u>	<u>Serving Suggestions</u>
STEP I WEEKS 1 & 2	*Choose legumes (dried beans and peas) as protein source.	*Have pea or lentil soup with bread for a main meal entree. *Substitute cooked or canned kidney beans or chick peas for other protein-rich foods like cheese, tuna or ham when on salad. *Have chili or rice for lunch or dinner.

<u>Steps</u>	<u>Recommendations</u>	<u>Serving Suggestions</u>
STEP II WEEKS 3 & 4	*Add an extra fruit or vege- table each day, make sure you reach your goal of 4 or more servings of fruits and vegetables daily. One serving is 1/2 cup canned or cooked fruit or vegetable or one medium-size fruit.	*Eat fresh or dried fruit with your break- fast cereal. *Keep raw vegetables in the refrigerator for low-calorie be- tween meal snacks. Try dipping them in a yogurt-based dip. *Serve the whole fruit or vegetable rather than the juice - a fresh orange at break- fast or a sliced apple as an appetizer. The amount of fiber in juices is insignifi- cant compared with that in the whole fruit or vegetable. *Eat the skin of clean- ed fruits and vege- tables such as apples, peaches, tomatoes, and carrots.

<u>Steps</u>	<u>Recommendations</u>	<u>Serving Suggestions</u>
STEP III	*Sprinkle bran	*Add a tablespoon
WEEKS	or 100% bran	or two of bran
5 & 6	cereal onto	onto ready-to-eat
	salads, fruits	cereals.
	vegetables and	
	dessert. Each	*Instead of potato
	tablespoon of	chips try nuts
	bran adds about	and fruits.
	2 grams of fiber	
	approximately	
	10 calories.	
	*Add nuts, seeds,	
	chopped dried	
	fruit and fresh	
	fruit to cereals	
	and desserts or	
	eat as snacks.	

RECIPES

FIBER FILLER CEREALS

Makes 8 servings* about $1\frac{1}{4}$ cups each

Each serving has 200 calories and 15 grams of fiber

2 $\frac{2}{3}$ cups Bran Flakes 1 $\frac{1}{2}$ cups Bran Buds
 1 $\frac{1}{2}$ cups Miller's Bran 1 cup sliced Almonds
 1 foil pkg. dried, chopped
 fruit bits

Combine bran flakes, bran buds, miller's bran, almonds and fruit bits in a large bowl, mix gently. Store in tightly covered container.

*A portion of each breakfast serving may be reserved for a snack, if you wish.

Yankee Bean Soup

Makes 4 servings

Each serving has 125 calories and 10 grams fiber.

- 2 cups cooked or canned Great Northern Beans
- 1 cup canned tomatoes, chopped
- 2 beef bouillon cubes
- 1/4 cup grated carrot
- 2 Tbsp. chopped celery and leaves
- 1/2 tsp. thyme or marjoram
- 1/4 cup instant minced onions or chopped fresh to taste
- imitation bacon bits

Combine all ingredients but the bacon bits. Simmer 15 - 30 minutes until beans are mushy. Sprinkle bacon bits on top of each serving.

Baked Eggplant Casserole

Each serving has 13 grams fiber and 225 calories

- 1 cup diced, peeled eggplant
- 1 tomato, diced
- 2 Tbsp. minced green pepper
- 1/2 cup green snap beans, broken into pieces
- 1/2 tsp. basil
- 1/4 tsp. oregano
- 1 Tbsp. diet margarine
- 1 small (6 oz.) Idaho potato
- salt

Combine eggplant, tomato, green pepper, beans, herbs and salt in small casserole. Dot with margarine. Cover and put in 400°F oven alongside baking potato. Bake for 45 minutes to 1 hour, until potato is fork-tender.



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